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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/822,572 | 04/12/2004 | Shawn L. Lloyd | ITL.1113US (P18785) | 2638 |
| 21906 | 7590 | 08/07/2006 | EXAMINER | |
| TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631 | | | HARVEY, JAMES R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2833 | |

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/822,572 | Applicant(s) LLOYD ET AL. | |
| | Examiner James R. Harvey | Art Unit 2833 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5-5-06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-11 and 13--19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-11 and 13--19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

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ETAILED ACTION

Claim Cancellations

The previous cancellations of claims 2 and 12 has been made of record.

Claim Rejections - 35 USC § 102

- The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

** Claim(s) 1 and 11 are very broad and can be rejected many ways. For example, claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Rathburn (6178629) from PTO-form 892 dated 6-7-05.

-- In reference to Claim(s) 1, Rathburn shows (figure 2A)

an upper surface with a plurality of solder ball receiving apertures (near the lead line of numeral 56) formed therein; and

an S-shaped spring contacts (154B; figure 10A) arranged in the apertures to electrically engage a solder ball 56 inserted into the aperture at a point spaced from the vertical center line of the solder ball (figure 2A).

-- In reference to Claim(s) 11, Rathburn shows (cover sheet)

a printed circuit board 52;

a socket coupled to the printed circuit board,

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the socket including a housing 44 having an upper surface with a plurality of solder ball receiving apertures (near the lead line of numeral 56) formed therein;

an S-shaped spring contacts 154B (figure 10 A) arranged in the apertures to electrically engage a solder ball 56 inserted into the aperture at a point spaced from the vertical center line of the solder ball (figure 2A).

Claim Rejections - 35 USC § 103

- The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

** Claim(s) 1, 3-11 and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hornchek et al. (US 6541991) in view of Higashi (US Pub. 2004/0166702).

-- In reference to Claim(s) 1, Hornchek shows (cover sheet)

an upper surface 372 with a plurality of solder ball receiving apertures 376 formed therein; and

a spring contacts 320 (column 4, line 50 and figure 8 of US Patent 5955888) contact arranged in the apertures to electrically engage a solder ball 126B (figure 6c) inserted into the aperture at a point spaced from the vertical center line of the solder ball (see examiner's figure within the response to amendments section herein).

However, Hornchek does not show that the spring contacts are S-shaped.

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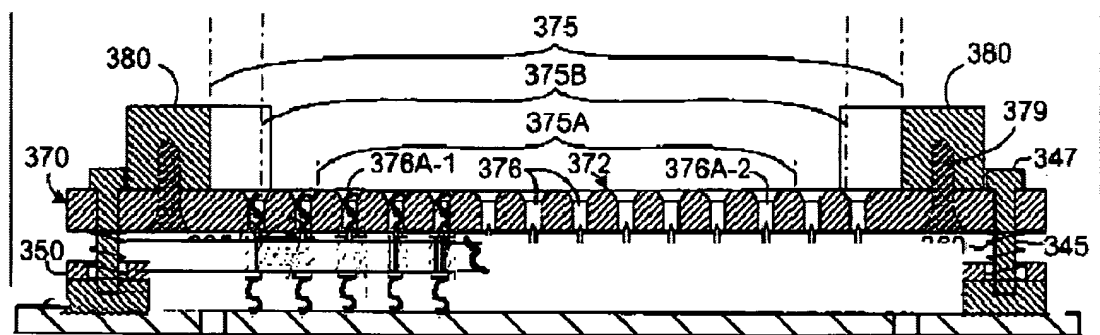
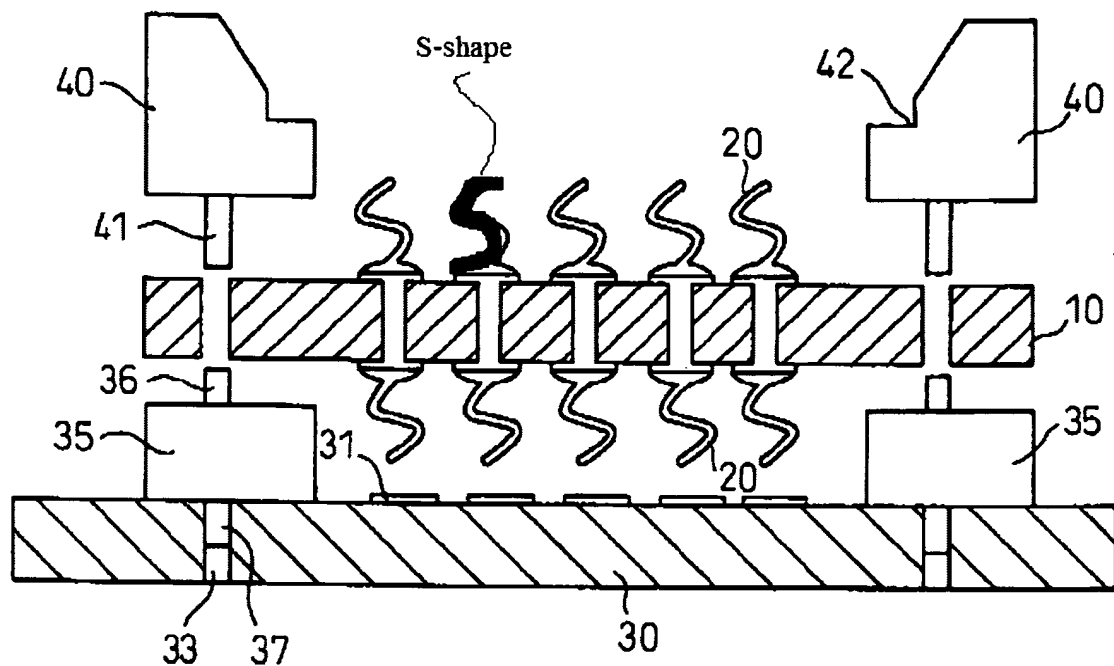
Higashi shows spring contacts 20 (see examiner's figure) are S-shaped and the combination of Hornchek and Higashi is considered to be adapted to make wiping electrical contact with a solder ball inserted into the aperture (see examiner's figure).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the shape spring contact to be an S-shape, since applicant has not presented any explanation that this particular shape is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing a mating surface between two parts. A change in shape is generally recognized as being within the level of ordinary skill in the art. In re Dailey, 149 USPQ 47 (CCPA 1976).

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the mounting plate 350 with spring contacts 320 of Hornchek with the mounting plate 10 with the S-shaped spring contact 20 Higashi (see examiner's figure).

One skilled in the art would have been motivated to replace the mounting plate and spring contacts because the spring contacts of Higashi have less components thereby making them easier and less expensive to manufacture.

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-- In reference to Claim(s) 11, Hornchek shows (cover sheet)

a printed circuit board 310;

a socket 300 coupled to the printed circuit board,

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the socket including a housing 370 having an upper surface 372 with a plurality of solder ball receiving apertures 376 formed ;

a spring contacts 320 (column 4, line 50 and figure 8 of US Patent 5955888) contact arranged in the apertures to electrically engage a solder ball 126B (figure 6c) inserted into the aperture at a point spaced from the vertical center line of the solder ball (see examiner's figure within the response to amendments section herein).

However, Hornchek does not show that the spring contacts are S-shaped.

Higashi shows spring contacts 20 (see examiner's figure) are S-shaped and the combination of Hornchek and Higashi is considered to be adapted to make wiping electrical contact with a solder ball inserted into the aperture (see examiner's figure).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the shape spring contact to be an S-shape, since applicant has not presented any explanation that this particular shape is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing a mating surface between two parts. A change in shape is generally recognized as being within the level of ordinary skill in the art. In re Dailey, 149 USPQ 47 (CCPA 1976).

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the mounting plate 350 with spring contacts 320 of Hornchek with the mounting plate 10 with the S-shaped spring contact 20 Higashi (see examiner's figure).

One skilled in the art would have been motivated to replace the mounting plate and spring contacts because the spring contacts of Higashi have less components thereby making them easier and less expensive to manufacture.

-- In reference to Claim(s) 3, Higashi shows (figure 5) the spring contacts are adapted to make wiping electrical contact with lands (claim 3).

In particular reference to the recitation “adapted to” is seen to be for the intended use of the claimed structure and is given little patentable weight, since it has been held a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, the claim language is not seen to claim any structure that would inhibit the reference from being used for the same purpose as the intended use recitations of the claim.

-- In reference to Claim(s) 4 and 13, Hornchek as modified by Higashi shows the S-shaped spring contacts include opposed contact arms (the top and bottom distal ends; Higashi (cover sheet)), one of which extends upwardly and the other which extends downwardly.

-- In reference to Claim(s) 5, Hornchek as modified by Higashi shows (cover sheet of Hornchek) the socket includes a body 370, the body having a plurality of solder ball receiving apertures 376 formed therein.

-- In reference to Claim(s) 6, Hornchek as modified by Higashi (cover sheet) shows an alignment (380; Hornchek) feature extending upwardly from the body 370.

In particular reference to the recitation “to align a land grid array package with the socket” is seen to be for the intended use of the claimed structure and is given little patentable weight, since it has been held a recitation with respect to the manner in which a claimed

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apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, the claim language is not seen to claim any structure that would inhibit the reference from being used for the same purpose as the intended use recitations of the claim.

-- In reference to Claim(s) 7, Hornchek as modified by Higashi shows (figure 6; Higashi) the spring contacts include an upwardly extending arm to make contact with an integrated circuit package 50 and a downwardly extending arm to make contact with an underlying circuit board 30.

-- In reference to Claim(s) 8, Hornchek as modified by Higashi shows the socket includes a body (370; Hornchek) including an upwardly extending protrusion 347.

However, Hornchek does not show the protrusion 347 having a height less than the height of a solder ball 126B (figure 6c) for a ball grid array package.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the size of the height of Hornchek protrusion 347, since such a modification would have involved a mere change in the size or shape of a component. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Daily*, 149 USPQ 47 (CCPA 1976). One skilled in the art would have been motivated to reduce the size of the protrusion 347 of Hornchek in order to reduce the amount of material used and thus reduce the overall cost of the assembly.

-- In reference to Claim(s) 9, Hornchek (figure 4) shows the alignment feature 380 is L-shaped.

-- In reference to Claim(s) 10, Hornchek (figure 4) shows two L-shaped alignment features opposed diagonally from one another on the socket.

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-- In reference to Claim(s) 13, Hornchek as modified by Higashi shows the same structure as address with claim 4.

-- In reference to Claim(s) 14, Hornchek as modified by Higashi shows (figure 6; Hornchek) the printed circuit board 310 has lands (column 6, line 52; Hornchek) engaged by the spring contacts. The meaning of "lands" is not set forth in the claims and is thus deemed to be so broad that it is met by the applied reference showing traces (column 6, line 52 of Hornchek).

-- In reference to Claim(s) 15, Hornchek shows (cover sheet) the housing 370 includes a protrusion 380 on its upper surface.

In particular reference to the recitation "to align a land grid array package with the housing" is seen to be for the intended use of the claimed structure and is given little patentable weight, since it has been held a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, the claim language is not seen to claim any structure that would inhibit the reference from being used for the same purpose as the intended use recitations of the claim.

-- In reference to Claim(s) 16, Hornchek shows (figure 4) the alignment protrusion is L-shaped.

-- In reference to Claim(s) 17, Hornchek shows (figure 4) two L-shaped alignment protrusion opposed diagonally from one another on the housing.

-- In reference to Claim(s) 18 and 19, Hornchek teaches (column 4, line 50) a ball grid array package or a land grid array package engaged on the socket housing (5955888; (column 9, lines 4-7).

Response to Amendment

- In response to applicant's assertion (page 5, lines 6-9) concerning that Rathburn does not show an embodiment of the S-shaped spring contact of figure 10b in a figure showing a solder ball receiving aperture in the same manner that is shown in figure 2A of Rathburn and therefore does not anticipate applicant's claim, the examiner disagrees. Rathburn is seen to teach (column 5, line 41) that a contact 42 (figure 2A) has a first circuit interface portion 62 that may extend above a first surface 64 of the housing 44. This same configuration is exhibited in figure 10A. Rathburn then goes on to teach that (column 5, line 45) either of the circuit interface portions 62, 66 may be recessed below the surfaces 64, 68 of the housing 44. To argue that figure 10A of Rathburn only shows the S-shaped spring contact 154B above the surface is seen to be without merit because Rathburn explicitly teaches that the interface portions can be recessed below the surface (column 5, line 46).

- In response to applicant's assertion (page 5, lines 22-25) that Hornchek teaches away from applicant's claimed invention, the examiner disagrees. Hornchek is a teaching reference that shows that it is known in the art to use a socket with solder ball receiving apertures. Applicant's argument is seen as a separate attack on Hornchek and it has been held that one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references. In re Keller, 208 USPQ 871 (CCPA 1981).

- In response to applicant's assertion (page 5, lines 26-28) that makes no sense since no such reference was ever applied to make out the rejection, does not convince the examiner that applicant's claims are allowed. The reference to 5,955, 888 was made in response to applicant's argument that Hornchek does not show spring contacts. Hornchek refers to reference 5,955, 888 (column 1, line 62) while teaching that the contacts are spring contacts. Figure 8 of reference 5, 955, 888 is seen to make it clear that the contacts disclosed in Hornchek are spring contacts. To remark that the there is considerable un-clarity in the rejection is seen to be without merit.

- In response to applicant's assertion (page 6, line 1) that there are no spring contacts disclosed by Higashi, the examiner disagrees. The cover sheet of Higashi shows spring contacts 20 and to imply ignorance over what is clearly a typographical error is not seen to advance the prosecution of this application.

- In response to applicant's assertion (page 6, line 5) that both reference teach in-line center contacts, the examiner disagrees. Higashi is not seen to make any implications that the contacts 20 are in-line and figure 6 of Higashi shows that the contacts are not in line with the center of the solder balls 52.

- In response to applicant's assertion (page 6, line 7) that a change in shape rejection is unsupportable, the examiner is not convinced. The examiner is not convinced because applicant remark is seen to be a. biased opinion that is not seen to be supported by any facts.

- In response to Applicant's argument (page 6, line 10) that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized

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that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. In re McLaughlin, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971).

- In response to applicant's assertion (page 6, lines 12-14) that applicant needs to make no further argument, other than to point out the failure to establish a *prima facie* rejection, the examiner declares that applicant's has failed to point out any errors within the rejection and the claims remain rejected as indicated herein.

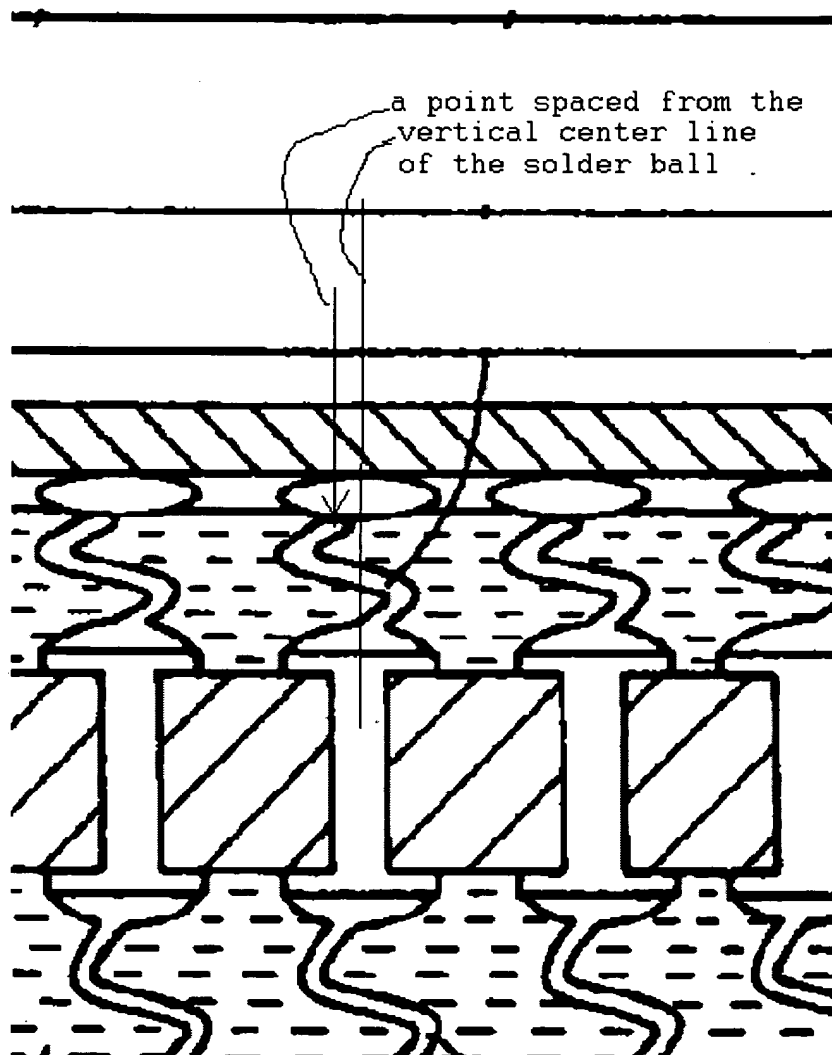
■ In response to applicant's response (page 5, line 16 of applicant's remarks dated 1-26-06) that the wiping electrical contact with the solder ball is at a pint spaced from the vertical center line of the solder ball has been explained explicitly, the examiner disagrees. The examiner disagrees because a review of applicant disclosure (also see US Publication 20050227509 of applicant's disclosure) does not show any special definition requiring a narrowing of the meaning of wiping nor is the text seen to mention the centerline of the solder ball. Further, applicant's figure 1 shows a contact adjacent the solder ball that is not seen to differentiate between the structure of Higashi (figure 10 (see examiner's figure)) that also shows a contact adjacent the solder ball.

■ In response to applicant's assertion (page 5, line 5 of applicant's remarks dated 1-26-06) that it is clear that figure 10 of Higashi hits the solder ball centrally, the examiner disagrees. Further, applicant's figure 1 shows a contact adjacent the solder ball that is

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not seen to differentiate between the structure of Higashi (figure 10 (see examiner's figure)) that also shows a contact adjacent the solder ball and both contacts are not centered upon the centerline of the solder ball (see examiner's figure).

Fig.10



Conclusion

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- **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

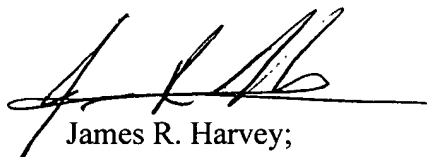
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

- Any inquiry concerning this communication or earlier communications from the examiner should be directed to James R. Harvey whose telephone number is 571-272-2007.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571-272-2800 extension 33.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

jrh
August 2, 2006



James R. Harvey;
Primary Examiner